

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TESLA, INC.,
Petitioner

v.

THE UNITED STATES OF AMERICA AS REPRESENTED BY THE
SECRETARY OF THE NAVY
(INTELLECTUAL VENTURES II LLC),
Patent Owner.

Case IPR2025-00341
Patent 7,181,743 B2

Before JASON W. MELVIN, AARON W. MOORE,
and RUSSELL E. CASS, *Administrative Patent Judges*.

MOORE, *Administrative Patent Judge*.

DECISION
Denying *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

Petitioner Tesla, Inc. filed a Petition for *inter partes* review of claims 10, 11, 14, 16, and 18 of U.S. Patent No. 7,181,743 B2 (Ex. 1001, “the ’743 patent”). Paper 2 (“Pet.”). Patent Owner Intellectual Ventures II LLC filed a Preliminary Response (Paper 6, “Prelim. Resp.”), Petitioner filed an authorized Reply (Paper 11, “Reply”), and Patent Owner filed an authorized Sur-reply (Paper 13, “Sur-reply”).¹

Institution of an *inter partes* review is authorized when “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a); *see* 37 C.F.R. § 42.108.

Having considered the Petition, the Preliminary Response, the Reply, and the Sur-reply, as well as the evidence of record, we conclude that Petitioner has *not* shown a reasonable likelihood that it will prevail in establishing the unpatentability of claims 10, 11, 14, 16, and 18 of the ’743 patent. We accordingly do *not* institute *inter partes* review.

A. Related Matters

The ’743 patent is or was at issue in *Intellectual Ventures II LLC v. Tesla, Inc.*, No. WDTX-1-24-cv-00390 (W.D. Tex. April 11, 2024); *Intellectual Ventures II LLC v. Tesla, Inc.*, No. WDTX-6-24-cv-00188 (W.D. Tex. April 12, 2024); and *Intellectual Ventures II LLC v. Tesla, Inc.*, No. WDTX-1-24-cv-00884 (W.D. Tex. April 12, 2024). *See* Paper 4, 2.

¹ Patent Owner also requested discretionary denial, but the request was denied. *See* Papers 8, 10, 12.

B. The '743 Patent

The '743 patent concerns “resource management systems by which networked computers cooperate in performing at least one task too complex for a single computer to perform,” and, more specifically, “a resource management system which dynamically and remotely controls networked computers to thereby permit them to cooperate in performing tasks that are too complex for any single computer to perform.” Ex. 1001, 1:23–30.

The patent describes the system as being composed of several major functional groups.

Functional group 1 is “Host and Network Monitoring” and “consists of software which monitors the host and network resources within the distributed environment” and “collects extensive run-time information on host and network configuration, statuses, and performance.” Ex. 1001, 7:29–33.

Functional group 2 is “Application-Level Instrumentation” and “provides general-purpose application event reporting and event correlation capabilities.” Ex. 1001, 7:41–42. It allows “for collecting and correlating application-provided data such as application statuses, states, performance, and internally detected errors.” *Id.* at 7:43–45. Applications use low-overhead API libraries to “send[] out key internal event and performance data.” *Id.* at 7:45–47. Additionally, the system “provides grammar-driven capabilities for correlating, combining, and reformatting application data into higher-level metrics (composite events) for use by displays or other Resource Management components.” *Id.* at 7:51–54.

Functional group 3 is “System Specifications” and allows the user to specify “application software system structure, capabilities, dependencies,

and requirements” and “hardware system (computer and network) structure, capabilities, and configuration.” Ex. 1001, 7:55–60.

Functional group 4 is “Resource Allocation Decision-Making” and “provides the reasoning and decision-making capabilities of the Resource Management architecture.” Ex. 1001, 8:6–7. It uses “information from other subsystems in order to determine the health and state of the distributed environment and the options that are available for attempting to recover from faults or unacceptable performance.” *Id.* at 8:8–12.

Functional group 5 is “Application (Resource) Control” and “provides application control (i.e., Program Control) capabilities which permit starting, stopping, and configuring applications on each of the hosts in the distributed environment.” Ex. 1001, 8:32–35.

Finally, functional group 6 is “Displays,” and “provides capabilities for visualizing the status, performance, and health of the hosts, networks, and applications in the distributed environment.” Ex. 1001, 8:56–59.

C. Illustrative Claims

Claim 10 of the ’743 is patent is the only independent claim that is subject to challenge. The claim recites function groups that correspond to the functional groups described above, except that “system specifications” and “displays” are not recited as separate function groups:

10. Software stored on at least one host for converting N networked hosts into a resource managed system instantiating M managed characteristic application computer programs, each

managed characteristic application computer program managed by one of the N networked hosts, the software comprising:

- a first function group which monitors the host and network resources;
- a second function group which provides application computer program event reporting and event correlation capabilities;
- a third function group which provides reasoning and decision making capabilities for the resource managed system, wherein the third function group comprises:
 - a first function which determines a state and health of the N hosts, a network operatively coupling the N hosts to one another and the M managed characteristic application computer programs in the distributed environment;
 - a second function which determines required allocation and reallocation actions needed to maintain a plurality of Quality of Service (QoS) requirements established for the M managed characteristic application computer programs, the QoS requirements dictating parameters regarding service quality of the M management characteristic application programs; and
 - a third function which generates automatic control signal requests corresponding to the actions dictated by the QoS requirements, such that the managed characteristic application computer programs are moved, shutdown, and started in accordance with satisfaction of the QoS requirements; and
- a fourth function group which provides program control capabilities permitting starting, stopping, and configuring of selected ones of the M managed characteristic application computer programs on respective ones of the N hosts in the resource managed system,

where M and N are positive integers and where M may be equal to, greater than, or less than N.

D. Asserted Grounds of Unpatentability

Petitioner asserts that claims 10, 11, 14, 16, and 18 are unpatentable on the following grounds:

References	Basis	Claims
Welch, ² Ravindran ³	§ 103	10, 11, 14, 16, 18
Welch, Ravindran, Hosokawa ⁴	§ 103	10, 11, 14, 16, 18

Petitioner also relies on a declaration by Dr. Erez Zadok, filed as Exhibit 1003.

II. DISCUSSION

A. Level of Skill in the Art

The level of skill in the art is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis. *See Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 1323 (Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966)). The level of skill in the art also informs the claim construction analysis. *See Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015) (explaining that claim construction seeks the meaning “a skilled artisan would ascribe” to the claim term “in the context of the specific patent claim”).

² Lonnie R. Welch, et al., “Distributed, Scalable, Dependable Real-Time Systems: Middleware Services and Applications,” in *Proceedings of the 13th International Parallel Processing Symposium and 10th Symposium on Parallel and Distributed Processing*, 297–301, IEEE Computer Society, 1999 (Ex. 1005).

³ L. R. Welch, B. Ravindran, et al., “Specification and Analysis of Dynamic, Distributed Real-Time Systems,” in *Proceedings of the 19th IEEE Real-Time Systems Symposium*, 72–81, IEEE Computer Society, 1998 (Ex. 1006).

⁴ U.S. Patent No. 6,088,727, issued Jul. 11, 2000 (Ex. 1007).

Petitioner asserts that a person of ordinary skill in the art would have “been someone knowledgeable and familiar with the areas of networking and distributed computing that are pertinent to the ’743 patent,” would “have a bachelor’s degree in computer science, computer engineering, electrical engineering, or equivalent training, and approximately 2-3 years of professional experience relating to distributed computing,” and that a “[l]ack of professional experience can be remedied by additional education, and vice versa.” Pet. 17 (citing Ex.1003, ¶¶ 32-34). Patent Owner does not address this issue in the Preliminary Response.

As Patent Owner does not dispute Petitioner’s characterization of the level of skill in the art, we adopt it for purposes of this analysis.

B. Claim Construction

In an inter partes review proceeding, we construe a claim of a patent “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” See 37 C.F.R. § 42.100(b). That involves construing claims in accordance with the ordinary and customary meaning of such claims as would have been understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. See *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc).

The Petition asserted that “no claim term requires express construction.” Pet. 17. In the Preliminary response, Patent Owner made arguments concerning the terms “event correlation capabilities” and “application programs,” and Petitioner requested briefing on those issues, which we allowed for both sides. See Ex. 3001. We will address those terms in the course of the obviousness analysis, as necessary.

C. Obviousness

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, primarily: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham*, 383 U.S. at 17–18.⁵

Ground 1 asserts that the challenged claims would have been obvious in view of Welch alone, or Welch in combination with Ravindran. *See* Pet. 18. Ground 2 adds Hosokawa to Welch and Ravindran. *See id.*

Welch

Welch is a paper titled “Distributed, Scalable, Dependable Real-Time Systems: Middleware Services and Applications” with a number of authors, including three of the four inventors named on the ’743 patent. It describes “middleware services that support [] dynamic real-time systems through adaptive resource management.” Ex. 1005, 1.

Welch “describes innovative QoS and resource management technology” that is “based on the dynamic path paradigm.” Ex. 1001, 1. Welch’s path-based system “typically consists of a detection & assessment

⁵ As Patent Owner does not offer objective evidence of non-obviousness or argue any secondary considerations, our analysis is based upon the first three of the four *Graham* factors.

path, an action initiation path and an action guidance path,” where “[t]he paths interact with the environment via evaluating streams of data from sensors, and by causing actuators to respond (in a timely manner) to events detected during evaluation of sensor data streams.” *Id.*

Welch explains that, while traditional load balancing systems “attempt to achieve system performance goals such as minimized response time or maximized throughput, dynamic QoS-based resource managers strive to meet the QoS requirements of each application they manage.” Ex. 1005, 1.

The logical architecture of Welch’s system has “application programs of real-time control paths send[ing] timestamped events to the metrics calculation component, which calculates path-level QoS metrics and sends them to the QoS monitor.” Ex. 1005, 2. “The monitor checks for conformance of observed QoS to required QoS, and notifies the QoS diagnosis component when a QoS violation occurs.” *Id.* Then, “QoS diagnosis notifies the action selection component of the cause(s) of poor QoS and recommends actions (e.g., move a program to a different host or LAN, shed a program, or replicate a program) to improve QoS.” *Id.* Subsequently, “[a]ction selection ranks the recommended actions, identifies redundant actions, and forwards the results to the allocation analysis component,” which “consults resource discovery for host and LAN load index metrics, determines a good way to allocate the hardware resources in order to perform the actions, and requests the actions be performed by the allocation enactment component.” *Id.*

The physical architecture of the QoS management system is shown in Figure 2, where “[t]he core component of the middleware is the resource manager,” which “is activated when programs die and when time-

constrained control paths miss their deadlines.” Ex. 1005, 2. In response to these events, the system “takes appropriate measures to improve the quality of service delivered to the applications” by “mak[ing] use of information provided by the hardware and software monitors, as well as from a specification file that describes QoS requirements and the structures of the software system and the hardware system.” *Id.* “When resource manager needs to start a program on a particular host, it informs the control program, which notifies [a] startup daemon on that host.” *Id.* at 3.

After describing the system, Welch reports experimental results, explaining that the system “was evaluated within the Naval Surface Warfare Center High Performance Computing (NSWC HiPer-D) Testbed.”

Ex. 1005, 4. Welch notes that the NSWC HiPer-D system included the following capabilities:

- (1) a simulated track source, (2) track correlation and filtering algorithms, (3) track data distribution services, (4) a doctrine server and three types of doctrine processing, (5) an engagement server, (6) a display subsystem including X windows based tactical displays, submode mediation, and alert routing surface operations, (7) a simulated weapons control system, and (8) identification upgrade capabilities.

Id.

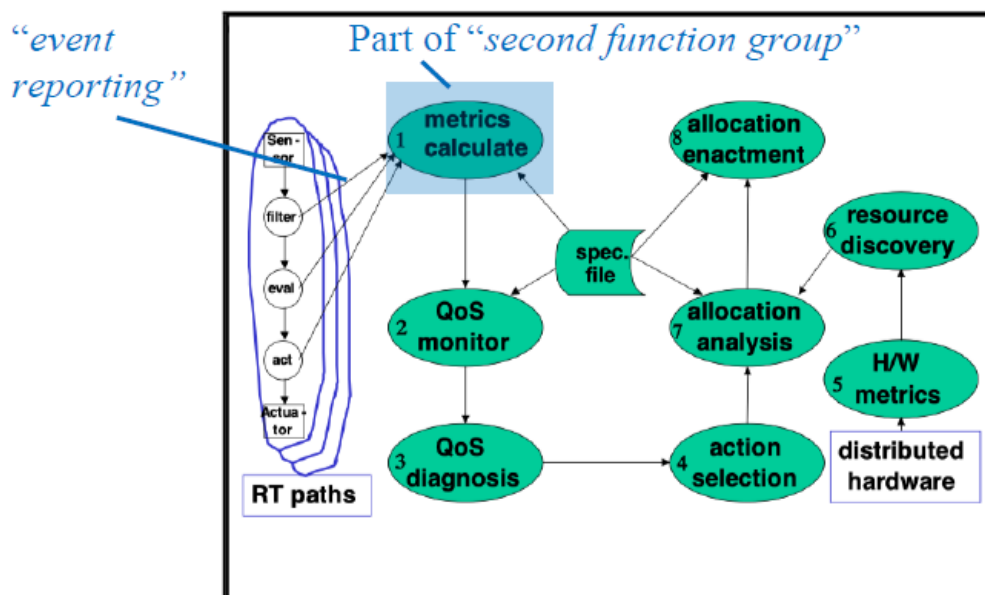
Analysis

We will focus on the limitation “a second function group which provides application computer program event reporting and event correlation capabilities” because it is dispositive.

The Petition asserts that “Welch’s QoS management software includes software monitors and a metrics calculation component that together teach a ‘second function group,’” and that “[t]he part of the QoS management

software corresponding to the “second function group” includes the functionality of providing “application computer program event reporting and event correlation capabilities.” Pet. 40.

According to Petitioner, “Welch’s QoS management software provides ‘application computer program event reporting’ because the ‘application programs of real-time control paths send timestamped events to the metrics calculation component, which calculates path-level QoS metrics and sends them to the QoS monitor.’” Pet. 40 (citing Ex. 1005, Ex. 1003 ¶ 153). Petitioner illustrates this with the following annotated version of Welch’s Figure 1:



Ex.1005, Fig. 1 (annotated); Ex.1003, ¶152.

Petitioner’s Annotated Version of Welch’s Figure 1

Pet. 41.

Petitioner further asserts that the “event reporting is also described and illustrated in [Welch’s] Fig. 3,” the description of which explains that “[t]he RTC continuously sends the application profile (event time stamps or

program/path latencies) information to QoS Monitors (step 7 of Figure 3).” Pet. 41 (citing Ex. 1005, 3). Petitioner additionally points to Welch’s description of how “the time-stamped events, path latencies, and other pieces of information are provided from the applications to the QoS monitors through “Software Monitors,” as shown in Fig. 2.” *Id.* at 42.

Petitioner is thus relying on the events reported from the applications to the metrics calculation component of Welch’s QoS management software for the claimed “events.” Those are the types of events contemplated in the system of the ’743 patent, which explains that “[c]apabilities are provided for collecting and correlating application-provided data such as application statuses, states, performance, and internally detected errors.” Ex. 1001, 7:42–45.

This claim limitation, however, also requires “event correlation capabilities.” For that, Petitioner asserts that “Welch’s metrics calculation component (part of the ‘second function group’) provides ‘event correlation capabilities’ because the QoS management software “implementation includes the following capabilities: . . . (2) track correlation and filtering algorithms.” Pet. 44–45 (citing Ex. 1003, 4). This, we find, mischaracterizes Welch’s disclosure, because Welch’s metrics calculation component does not perform the identified “correlation.”

The language quoted by Petitioner comes from the experimental results section of Welch, which describes how the implementation of the NSWC HiPer-D testbed, the system that was used test Welch’s QoS middleware, included “track correlation and filtering algorithms.” Ex. 1005, 4. Welch is not explaining that the middleware correlates the QoS system level events that Petitioner has identified as the claimed “events,” but,

instead, that the NSWC HiPer-D system that was used to test the middleware included the ability to correlate radar data in a shipboard anti-air-warfare system.⁶ The correlating mentioned in Welch occurs at the application level, not in the middleware.

As noted, the parties submitted additional briefing on the construction of “event,” in which Petitioner argued that the term should be broad enough to include “processing radar sensor data, performing radar tracking initialization and refinement, and distributing radar tracking information to other modules,” and Patent Owner argued that the specification uses the term as “as an umbrella term to cover various types of ‘internal event and performance data’ such as ‘application statuses, states, performance, and internally detected errors.’” Reply 1; Sur-reply 2.

We agree with Patent Owner that that claimed “events” must concern “application statuses, states, performance, and internally detected errors.” See Ex. 1001, 7:44–45. The patent explains that function group 2 collects that type of information from applications using an API and then “correlate[es], combin[es], and reformat[s] [the] application data into higher-level metrics (composite events) for use by displays or other Resource Management components.” *Id.* at 7:52–54. The middleware described and claimed in the ’743 is concerned with how applications are performing, not what they doing.

⁶ Welch cites L. R. Welch, B. Ravindran, R. Harrison, L. Madden, M. Masters and W. Mills, “*Challenges in Engineering Distributed Shipboard Control Systems*,” The IEEE Real-Time Systems Symposium, December 1996 (Ex. 2006) for details of the testbed. It identifies “software components that perform the tasks of collecting, filtering, correlating and classifying [radar] sensor data.” Ex. 1006, 3; see *id.* Fig. 1.

Welch’s radar sensor data is application-level information (e.g., data from radar sensors⁷), not information about the status, state, performance, or internally detected errors of an application that would be meaningful in a QoS middleware system like that described in the ’743 patent. Petitioner does not explain, and we do not see, what use a middleware system would have for information such as whether a missile was or was not on a particular path.

Moreover, even assuming the radar data could constitute “events” within the meaning of these claims, the Petition fails to show that Welch’s “metrics calculation component,” which Petitioner identifies as the component that performs the correlating (*see* Pet. 44–45 (citing Ex. 1003, 4)), correlates radar data. We find nothing in Welch to suggest that the QoS middleware, or its metrics calculation component, correlates, or otherwise has anything else do with, the radar data.

As a fallback, Petitioner asserts that “given that Welch’s ‘applications are dependent (communicate with each other),’ the performance information of those applications includes “event correlation capabilities.” Pet. 45 (citing Ex.1005, 2; Ex. 1003 ¶¶ 158–59). We find this unpersuasive because Petitioner does not explain, and we do not see, why it should follow from the fact that applications communicate with each other that events are correlated.

Petitioner additionally argues that “Welch’s software monitors and metrics calculation component aggregate the information received from the

⁷ *See* Ex. 2006, 3 (“The sensors are typically hardware devices (although occasionally sensors are software probes) that provide data regarding the status of various environmental entities.”).

real time control systems (RTCS) through the software monitors: ‘The application programs of real-time control paths send timestamped events to the metrics calculation component, which calculates path-level QoS metrics and sends them to the QoS monitor.’” Pet. 45 (citing Ex. 1005, 2–3). The claim, however, requires “correlation” not “aggregation,” and Petitioner provides no basis for conflating those distinct concepts.

For these reasons, we conclude that Petitioner has not shown that Welch teaches or suggests a function group that “provides application computer program event reporting and event correlation capabilities” as required by each challenged claim.

III. CONCLUSION

Petitioner has not demonstrated a reasonable likelihood of showing the unpatentability of claims 10, 11, 14, 16, and 18 of the ’743 patent.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that an *inter partes* review is *not* instituted in this proceeding.

Case IPR2025-00341

Patent 7,181,743 B2

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